

What is claimed is:

1 1. A liquid separator for a gas analyzer, said
2 liquid separator comprising:
3 a closed container including a sample inlet port,
4 a sample outlet port, and a low pressure port;
5 said container defining a liquid collection
6 chamber;
7 a liquid trap filter chamber integral with said
8 container, said liquid trap filter chamber including
9 an inlet compartment interposed between said sample
10 inlet port and said sample outlet port for receiving a
11 gas sample introduced into said sample inlet port,
12 said inlet compartment having an upper outlet
13 communicated with said sample outlet port and a lower
14 outlet communicated with said liquid collection
15 chamber; and
16 a liquid trap filter element contained in said
17 inlet compartment interposed between said sample inlet
18 port and said sample outlet port for separating liquid
19 from the gas sample, liquid separated from the gas
20 sample passing through said lower outlet to said
21 collection chamber.

1 2. The liquid separator according to claim 1,
2 wherein said inlet compartment includes a barrier
3 interposed between said filter element and said sample
4 outlet port, said barrier defining said upper outlet.

1 3. The liquid separator according to claim 2,
2 wherein said liquid trap filter chamber includes a
3 cover which encloses said filter element within said
4 inlet compartment.

1 4. The liquid separator according to claim 3,
2 wherein said cover includes at least one concave
3 filter engaging surface engaging said filter element
4 to trap said filter element between said cover and
5 said barrier.

1 5. The liquid separator according to claim 1,
2 wherein said filter element comprises a membrane
3 bearing a polytetrafluoroethylene laminate.

1 6. The liquid separator according to claim 1,
2 wherein said liquid trap filter chamber includes an
3 outlet compartment interposed between said collection
4 chamber and said low pressure port, said outlet
5 compartment having an inlet communicated with said
6 collection chamber and an outlet communicated with
7 said low pressure port, and a second liquid trap
8 filter element contained in said outlet compartment
9 interposed between said inlet and said outlet of said
10 outlet compartment.

1 7. The liquid separator according to claim 6,
2 wherein said outlet compartment includes a barrier
3 interposed between said second filter element and said
4 low pressure port, said barrier defining said outlet
5 port of said outlet compartment.

1 8. The liquid separator according to claim 6,
2 wherein said second filter element comprises a
3 membrane bearing a polytetrafluoroethylene laminate.

1 9. The liquid separator according to claim 1,
2 and including a self-sealing filter in at least one of
3 said sample outlet port and said low pressure port.

1 10. A liquid separator for a gas analyzer, said
 2 liquid separator comprising:
 3 a sample inlet port;
 4 a sample outlet port;
 5 an inlet compartment having an inlet in fluid
 6 communication with said sample inlet port for
 7 receiving a gas sample introduced into said sample
 8 inlet port, said inlet compartment having an upper
 9 outlet communicated with said sample outlet port;
 10 a liquid collection chamber in fluid
 11 communication with said inlet compartment for
 12 receiving liquid from said inlet compartment;
 13 a low pressure port;
 14 an outlet compartment interposed between said
 15 collection chamber and said low pressure port, said
 16 outlet compartment having an inlet communicated with
 17 said collection chamber and an outlet communicated
 18 with said low pressure port; and
 19 a gas permeable, liquid impermeable filter
 20 element contained in one of said inlet compartment and
 21 said outlet compartment, interposed between said inlet
 22 and outlet of said one compartment for substantially
 23 preventing flow of liquid while allowing the flow of
 24 gas from said inlet to said outlet of said one
 25 compartment.

1 11. The liquid separator according to claim 10,
 2 wherein said filter element is contained in said inlet
 3 compartment interposed between said sample inlet port
 4 and said upper outlet for separating liquid from the
 5 gas sample.

1 12. The liquid separator according to claim 10,
2 wherein said filter element is contained in said
3 outlet compartment interposed between said inlet of
4 said outlet compartment and said outlet of said outlet
5 compartment for substantially preventing the passage
6 of liquid through said outlet compartment to said low
7 pressure port.

1 13. The liquid separator according to claim 10,
2 wherein at least said one compartment includes a cover
3 separating said inlet and outlet compartments.

1 14. A liquid separator according to claim 10,
2 wherein said filter element comprises a membrane
3 bearing a polytetrafluoroethylene laminate.

1 15. The liquid separator according to claim 10,
2 including a self-sealing filter in at least one of
3 said sample outlet port and said low pressure port.

1 16. A liquid separator for a gas analyzer, said
2 liquid separator comprising:
3 a sample inlet port;
4 a sample outlet port;
5 an inlet compartment having an upper outlet
6 communicated with said sample outlet and a lower
7 outlet communicated with said collection chamber;
8 a gas permeable, liquid impermeable filter
9 element contained in said inlet compartment interposed
10 between said sample inlet port and said upper outlet
11 for separating liquid from the gas sample;
12 said inlet compartment including a barrier
13 interposed between said filter element and said sample

14 outlet port, said barrier defining said upper outlet;
15 and
16 a liquid collection chamber for receiving liquid
17 passed through said lower outlet of said inlet
18 compartment.

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1 17. The liquid separator according to claim 16,
2 including an outlet compartment interposed between
3 said collection chamber and said low pressure outlet,
4 said outlet compartment having an inlet communicated
5 with said collection chamber and an outlet
6 communicated with said low pressure port, and a second
7 gas permeable, liquid impermeable filter element
8 contained in said outlet trap filter compartment
9 interposed between said inlet and said outlet of said
10 outlet trap filter compartment.

1 18. The liquid separator according to claim 17,
2 wherein said first-mentioned and said second filter
3 elements each comprises a membrane bearing a
4 polytetrafluoroethylene laminate.

1 19. A liquid separator for a gas analyzer, said
2 liquid separator comprising:
3 a sample inlet port;
4 a sample outlet port;
5 a liquid collection chamber;
6 a separation compartment for separating liquid
7 from the gas sample, said separation compartment
8 having an upper outlet communicated with said sample
9 outlet port and a lower outlet communicated with a
10 collection chamber;
11 a low pressure port; and

12 an outlet compartment interposed between said
13 collection chamber and said low pressure port, said
14 outlet compartment having an inlet communicated with
15 said collection chamber and an outlet communicated
16 with said low pressure port, and a gas permeable,
17 liquid impermeable filter element contained in said
18 outlet compartment interposed between said inlet and
19 said outlet of said outlet compartment.

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20. A liquid separator for a gas analyzer, said
liquid separator comprising:
a sample inlet port;
a sample outlet port;
an inlet compartment for receiving a gas sample
introduced into said sample inlet port, said inlet
compartment having an upper outlet communicated with
said sample outlet port and a lower outlet
communicated with said collection chamber;
a first gas permeable, liquid impermeable filter
element contained in said inlet compartment interposed
between said sample inlet port and said upper outlet
for separating liquid from the gas sample;
a liquid collection chamber receiving liquid
passed through said lower outlet of said inlet trap
filter compartment;
a low pressure port;
an outlet compartment interposed between said
collection chamber and said low pressure port, said
outlet compartment having an inlet communicated with
said collection chamber and an outlet communicated
with said low pressure port; and
a second gas permeable, liquid impermeable filter
element contained in said outlet compartment

- 25 interposed between said inlet and said outlet of said
26 outlet compartment.

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